

this arrangement. In all of them the potential varied under the influence of the rays by an amount similar in direction and magnitude to that previously observed.

§ 13. I have observed that the activity of the vacuum bulb seems to determine, to some extent, the potential difference observed on the electrometer; that is to say, if the rays are very weak and unsteady (as judged by the fluorescence of the vacuum bulb) they do not make the air sufficiently electrolytic to counterbalance the contact potential difference between the surfaces of the plates. Thus, when the bulb is not fluorescing brightly and steadily, one gets results which are uncertain and perplexing. But these appear to give place in all cases to more definite values whenever the rays are strong and steady.

§ 14. The conclusions I have drawn from these experiments are that (1) the influence of the rays on the zinc and tinfoil plates does not cause any direct or sudden change in their contact potential, but that (2) the air through which the rays pass is temporarily converted into an electrolyte, and when in this condition forms a connexion between the plates which has the same properties as a drop of acidulated water, namely, it rapidly reduces the potential between the opposing surfaces of the plates to zero, and may even reverse it to a small extent.

It is interesting to note that this electrolytic property was found by Lord Kelvin ('Electrostatics and Magnetism,' Art. XXIII, §§ 412—414) to be possessed by the fumes from a burning spirit lamp. In both cases its cause is probably the same. It is, no doubt, due to a want of electrical equilibrium among, and a partial dissociation of, the molecules of the gas.

VI. "The Effect of Röntgen's Rays on Cloudy Condensation."

By C. T. R. WILSON, B.Sc. (Vict.), B.A. (Cantab.), Clerk-Maxwell Student. Communicated by Professor J. J. THOMSON, F.R.S. Received March 3, 1896.

In a paper on "The Formation of Cloud in the Absence of Dust," read before the Cambridge Philosophical Society, May 13th, 1895, I showed that cloudy condensation takes place in the absence of dust when saturated air suffers sudden expansion exceeding a certain critical amount.

I find that air exposed to the action of Röntgen's rays requires to be expanded just as much as ordinary air in order that condensation may take place, but these rays have the effect of greatly increasing the number of drops formed when the expansion is beyond that necessary to produce condensation.

Under ordinary conditions, when the expansion exceeds the critical

value, a shower of fine rain falls, and this settles within a very few seconds; if, however, the same expansion be made while the air is exposed to the action of the rays, or immediately after, the drops are sufficiently numerous to form a fog, which persists for some minutes.

In order that direct electrical action might be excluded, experiments were made with the vessel containing the air wrapped in tinfoil connected to earth. This was exposed to the rays; the air was then expanded, the current switched off from the induction coil, and finally the tinfoil removed to examine the cloud formed.

As before, a persistent fog was produced with an expansion which without the rays would only have formed a comparatively small number of drops.

It seems legitimate to conclude that when the Röntgen rays pass through moist air they produce a supply of nuclei of the same kind as those which are always present in small numbers, or at any rate of exactly equal efficiency in promoting condensation.

VII. "On the Relations of Turacin and Turacoporphyrin to the Colouring Matter of the Blood." By ARTHUR GAMGEE, M.D., F.R.S., Emeritus Professor of Physiology in the Owens College, Victoria University. Received March 12, 1896.

In a recent paper read before the Royal Society, I have shown that the intense absorption band in the extreme violet, which is observed, by means of photography, in the spectrum of highly diluted solutions of hæmoglobin and its compounds, is (with slight changes in its position) exhibited by certain of the derivatives of the blood colouring matter, *e.g.*, by hæmochromogen and the compounds of hæmatin, and by that remarkably interesting coloured but iron-free derivative of the latter body, hæmatoporphyrin.

Having found that no organic body which I had examined (not even such as the colouring matters of *alkanet-root* or *picro-carmine*, which present in the visible spectrum absorption bands not unlike those of the blood colouring matter) exhibits an absorption band occupying the position, or possessed of the remarkable intensity, of the extreme violet band under discussion, it seemed as if the latter owed its origin to a group of atoms existing in and perhaps characteristic of the blood colouring matter, which group remains intact in certain of the products of decomposition of the complex hæmoglobin molecule, whereas it does not exist in certain other of the derivatives of the hæmochromogen or hæmatin moiety of the molecule, such as *bilirubin* and *urobilin*.